

REMARKS

Foreign Priority

The acknowledgement, in the Office Action, of a claim for foreign priority under 35 U.S.C. § 119(a)-(d), and that the certified copy of the priority document has been received, is noted with appreciation.

Status Of Application

Claims 1-14 are pending in the application; the status of the claims is as follows:

Claims 1-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Published Unexamined Patent Application No. 11-52451 (A) to Funabashi ("Funabashi") in view of U.S. Patent No. 5,654,565 to Hokari ("Hokari").

Claims 1, 2, 8 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,510,826 to Koide ("Koide") in view of U.S. Patent No. 5,365,307 to Sugiyama ("Sugiyama"), and further in view of Hokari.

Drawings

The indication, in the Notice of Draftsperson's Patent Drawing Review, that the Official Draftsperson has no objections to the drawings, is noted with appreciation.

Claim Amendments

Claims 1 and 4 have been amended to correct minor errors of form. These changes are not necessitated by the prior art, are unrelated to the patentability of the invention over the prior art, and do not introduce any new matter.

35 U.S.C. § 103(a) Rejections

The rejection of claims 1-14 under 35 U.S.C. § 103(a), as allegedly being unpatentable over Funabashi in view of Hokari, is respectfully traversed based on the following.

Funabashi shows an aperture control/shutter system where the aperture opening is controlled by two wing shaped blades 2 and 3. The blades are positioned in front of a converging section 1 including an opening 6. The wings are held in place by a pressure plate 4 and are manipulated using motor 5. When the wings are positioned at an intermediate position between a fully opened aperture and fully closed aperture, a peak or triangular shaped portion T (Figure 6(B)) is formed, which causes detrimental performance of the optical system including this diaphragm. To address this problem, Funabashi includes linear cutlines 6a and 6b, which block the undesirable light (paragraph 35). There is no discussion of any image sensor of any type in Funabashi, much less any portion of a light sensor or the shape of such portion.

Hokari shows a charge coupled device 11, where each CCD element includes a focusing lens 71. The only discussion of the shape of the sensors is in Figure 1 where prior art sensors 101 appear to be square.

In contrast to the cited references, claim 1 includes:

an image sensor having rectangular light receiving portions arranged in a matrix, and microlenses disposed in correspondence with said light receiving portions, said light receiving portions and said microlenses being formed integrally with each other; and ...

wherein the diaphragm has a shape in a horizontal direction that coincides with a shape of said light receiving portions of said image sensor.

Neither cited reference shows or suggests an image sensor having rectangular light receiving portions. As is clear from Figures 1 and 2 of Hokari because of the positioning of the cut line 11 in Figure 1 to the elements of Figure 2, the light receiving portions of CCD 111 are square.

The Office Action states that Funabashi discloses an image pickup device. Applicants respectfully disagree. Funabashi only shows an aperture stop/shutter mechanism. While this is clearly for use with a camera, there is no discussion of how the image is recorded. In addition, the Office Action states that "conventionally" light receiving portions are formed in a matrix shape wherein the horizontal direction of the diaphragm coincides with a matrix shape.

First, claim 1 does not include a limitation to the overall shape of the image sensor, but rather includes a limitation related to the shape of light receiving portions of the image sensor. Second, assuming for the sake of argument that the statement regarding the relationship of matrix shape of light sensors and diaphragms is conventional, that suggests nothing regarding the use a particular diaphragm shape with a matrix including microlenses. The microlenses provide their own optical complications. Combining a particular diaphragm shape with microlenses may or may not prove satisfactory. There is nothing in the cited references that indicate to one skilled in the art that any particular result would follow from the combination of any particular diaphragm shape with a matrix including microlenses.

There is nothing in cited references that shows or suggest an image sensor having rectangular light receiving portions arranged in a matrix used with a diaphragm having a shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor. Moreover, there is nothing in cited references that shows or suggest an image sensor having rectangular light receiving portions with integrally formed microlenses arranged in a matrix used with a diaphragm having a shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor. To support *prima facie* obviousness, the cited references when combined must show every limitation of the claim. MPEP §2143.03. Thus, claim 1 is not *prima facie* obvious over the cited references. Claims 2 and 3 are dependent upon claim 1. A claim that is dependent upon a nonobvious claim is also nonobvious. MPEP §2143.03.

Also in contrast to the cited references, claim 4 includes:

an image sensor having rectangular light receiving portions arranged in a matrix, and microlenses disposed in correspondence with said light receiving portions,
...; and
the light restricting plate whose shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor, said light restricting plate being provided separately from said diaphragm.

As shown above with regard to claim 1, the cited prior art does not show or suggest image sensor having rectangular light receiving portions arranged in a matrix used with a diaphragm having a shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor. Similarly, the cited prior art does not show or suggest an image sensor having rectangular light receiving portions arranged in a matrix used with a light restricting plate having a shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor in conjunction with a diaphragm. Because the cited references do not show or suggest every limitation of claim 4, claim 4 is not obvious over the cited references. Claims 5-7 are dependent upon nonobvious claim 4 and thus are also nonobvious.

Also in contrast to the cited references, claim 8 includes:

a diaphragm whose shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor

As noted above with regard to claim 1, this limitation is neither shown nor suggested in the cited references. Therefore, claim 8 is nonobvious over the cited references. Claims 9 and 10 are dependent upon claim 9 and thus also nonobvious over the cited references.

Also in contrast to the cited references, claim 11 includes:

a diaphragm; and
a light restricting plate whose shape in a horizontal direction
coincides with a shape of said light receiving portions of said image sensor,
said light restricting plate being provided separately from said diaphragm.

As noted above with regard to claim 4, this limitation is neither shown nor suggested in the cited references. Therefore, claim 11 is nonobvious over the cited references. Claims 12-14 are dependent upon claim 11 and thus also nonobvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 1-14 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Funabashi in view of Hokari, be reconsidered and withdrawn.

The rejection of claims 1, 2, 8 and 9 under 35 U.S.C. § 103(a), as allegedly being unpatentable over Koide in view of Sugiyama, and in further view of Hokari, is respectfully traversed based on the following.

Koide shows an optical scanning apparatus for writing an image in, for example, a laser printer (column 1, lines 7-14). A light source 1 is collimated by collimator lens 2. A stop member 4 limits the vertical extent of the light beam, which is further limited in a subscanning direction by cylindrical lens 3. An optical deflector 5 causes the beam to scan photosensitive drum 7 via focusing optical system 6. This system is used to scan a digitized image signal onto the photosensitive drum for laser printing

Sugiyama shows a microfilm F reader for projecting the contents of the microfilm (Figure 2) or scanning the contents onto a photo sensitive drum 10 for printing. Sugiyama states that photo sensitive drum 10 can be replaced with a linear image sensor for capturing an digital image of the microfilm contents (column 2, lines 58-63).

In contrast to the cited references, claim 1 includes:

an image sensor having rectangular light receiving portions arranged in a matrix, and microlenses disposed in correspondence with said light receiving portions, said light receiving portions and said microlenses being formed integrally with each other;

an image input optical system for forming an image on said image sensor, said image input optical system including a diaphragm; and

a diaphragm whose shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor.

Koide uses optical deflector 5 to scan the width of photosensitive drum 7. Thus, the only portion of the scanning mechanism related to the width of the drum are the faces of optical deflector 5. It is clear from the use of a scanning process that the opening in stop member 4 bears no relationship to the width of photosensitive drum 7. Thus, Koide does not show or suggest a diaphragm having a shape in a horizontal direction that coincides with the shape of any light receiving portion. The substitution of an electronic sensor for a photosensitive drum, as suggested by Sugiyama, does not change the relationship of the light receptor (*i.e.* photosensitive drum 7) and stop member 4. Thus, neither reference shows or suggests this limitation. In addition, Sugiyama substitutes the image sensor receptor in order to capture a digital image microfilm image. One skilled in the art would not be motivated to combine the image sensor of Sugiyama with the scanning mechanism of Koide because the resulting mechanism would scan a digital image as provided to light source 1 of Koide only to convert it back to a digital image using the image sensor of Sugiyama, thus accomplishing nothing. Thus, the combined references cited do not show every limitation of claim 1 and one skilled in the art would not be motivated to combine the cited teachings of the cited references. Therefore, claim 1 is nonobvious over the cited references. Claim 2 is dependent upon claim 1 and is thus also nonobvious.

Also in contrast to the cited references, claim 8 includes:

a diaphragm whose shape in a horizontal direction coincides with a shape of said light receiving portions of said image sensor.

As noted above with regard to claim 1, the cited references do not show or suggest this limitation and one skilled in the art would not be motivated to combine the references as stated in the Office Action. Therefore, claim 8 is nonobvious over the cited references. Claim 9 is dependent upon claim 8 and thus is also nonobvious.

Accordingly, it is respectfully requested that the rejection of claims 1, 2, 8 and 9 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Koide in view of Sugiyama, and in further view of Hokari, be reconsidered and withdrawn.


CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Respectfully submitted,

By: _____


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